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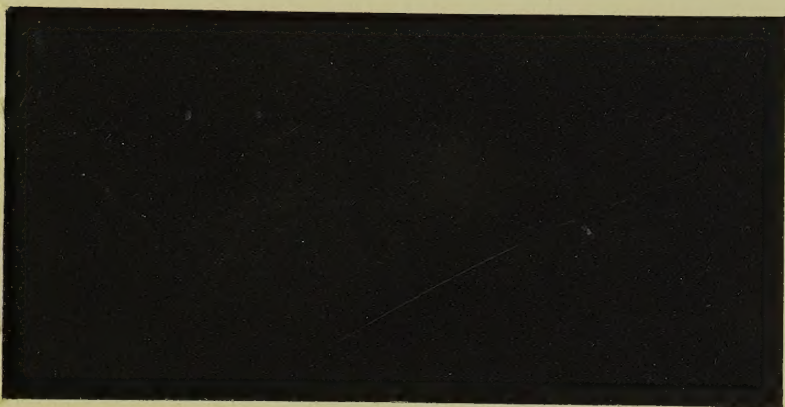
proposed consulting program

MUNICIPAL MAINTENANCE
MANAGEMENT
FOR
THE CITY OF HAMILTON



STEVENSON & KELLOGG, LTD.

management consultants



proposed
consulting
program

MUNICIPAL MAINTENANCE
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FOR
THE CITY OF HAMILTON

prepared for

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City of Hamilton, Ontario.

submitted by

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I

INTRODUCTION

The City of Hamilton Department of Streets and Sanitation continues to operate steadily. You have an annual budget of nearly eight million dollars. You believe that departmental effectiveness can be improved by helping your supervisors and managers become better managers.

You propose to achieve this improvement by:

- ▶ involving your foremen and other staff in program performance budgeting;
- ▶ providing current project management information feed-back for improved planning and coordination.

You plan to implement the Roads Maintenance Management System developed for the Ministry of Transportation and Communications. This provides the means to bring your reporting to M. T. C. into line with other municipalities as well as to improve your supervisory and managerial skills and performance.

You have asked Stevenson & Kellogg, Ltd. to show you how we can assist you in implementing the M. T. C. Roads Maintenance Management System.

Your request for submission of a proposal asks that specific points be covered. The following proposal is submitted for your consideration. We have covered these points in detail.

II

BACKGROUND

The 1974 Streets and Sanitation budget was struck at \$7.8 million -- seven million for maintenance of roadways, roadsides and refuse collection. This was 47% higher than the previous three year average. These are substantial sums of money. You recognize the need for good work planning and control.

Your present reporting system satisfies the fiscal requirements of the City Treasury Department. You also need clear and up-to-date management reports based on maintenance activities. This is the focus of the results you expect from this program.

There are some five hundred and eighty-five road miles in Hamilton. Your Streets and Sanitation Department is responsible for all maintenance and repair work within the width limit of the road allowance. This includes one hundred and twenty miles of major arterial roads that will be designated as Regional in the future. You expect to maintain these roads on behalf of the Region.

Your department is not responsible for:

- ▶ construction or betterment projects;
- ▶ sewer maintenance;
- ▶ water distribution;
- ▶ traffice and safety systems.

Department operations to be included in the study are divided geographically into five maintenance districts. Each district represents a different set of physical and environmental characteristics. While most maintenance activities are common to all districts, the mix of activities (and possibly some productivity standards) is different in each. The Maintenance Management System must be designed to recognize these differences.

An up-to-date inventory of roadways is available. You and we believe that this inventory will provide most of the prime data for quantity standards based on level of service. A few elements may still need to be inventoried -- for example, grass areas to be maintained (mowing and weed control), culverts, manholes and catch basins.

You have experienced and qualified staff totalling 390 employees. You are fortunate to have a reasonable spread in ages of supervisory personnel. This provides a desirable blend of experience and youth that should respond well to the introduction of new management systems.

III

PROPOSED PROGRAM

A. SCOPE

The Maintenance Management System will be designed to provide a basis on which to plan, organize, direct and control all maintenance activities carried out by the Department of Streets and Sanitation. These activities include:

- ▶ Road surface maintenance,
- ▶ Shoulder maintenance,
- ▶ Roadside maintenance,
- ▶ Drainage and road structures maintenance,
- ▶ Winter control,
- ▶ Tree maintenance and beautification.

A built-in flexibility will be included in the design of the system to permit expansion to include other activities in the future.

Implementation of the program in the five districts will include:

- ▶ Roads
- ▶ Sidewalks
- ▶ Curbs
- ▶ Boulevards
- ▶ Trees on the road allowance.

We believe the most effective program is one that is implemented in stages. This permits establishing procedures, making corrections -- in fact, setting the stage for a successful program with a small group dedicated to making the system operate.

We propose using one district as a pilot program. Other districts would be included afterwards within the total time frame shown.

We believe that the system reporting should be computerized. We recognize that existing fiscal data must be maintained. We will work with your systems group to assure compatibility of the fiscal and management reporting.

We do not see computerization as a first step. Rather, we prefer to develop a smoothly operating manual system. When this stage is reached, the transition to computer is comparatively easy.

B. OUR PART

We will provide assistance and principal leadership to implement the Maintenance Management System described in your terms of reference.

We will work under the direction of the Director of Street Services and confer regularly with your Advisory Committee.

The project is divided into eleven major phases as illustrated in Figure 1 following. Throughout the program, we will be available to help familiarize all levels of management with the program.

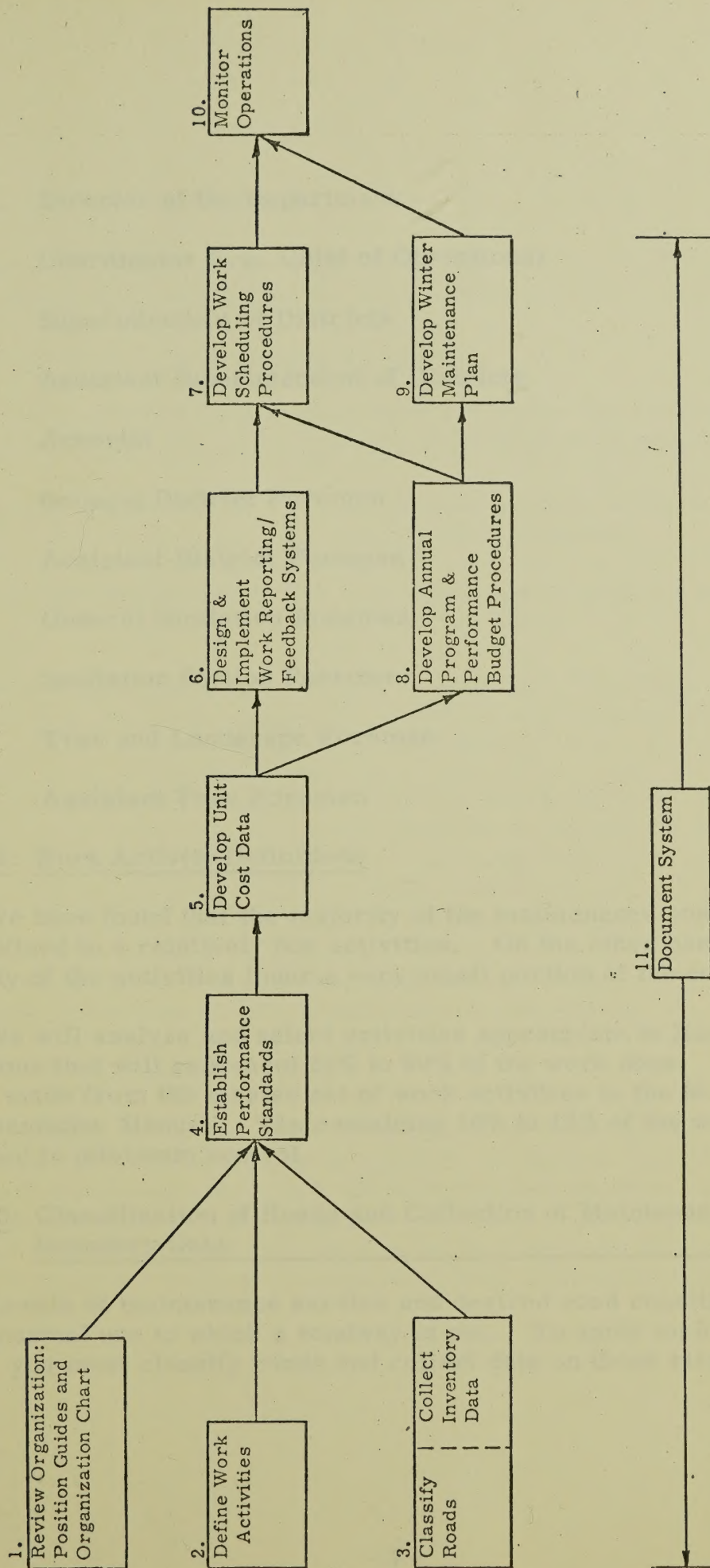
Phase I: Organization Review

We will review the organizational structure of the Department in depth. We will recommend changes where required to provide a firm base on which to operate your Maintenance Management System.

All managerial and supervisory positions will be reviewed so that position outlines and the formal organizational relationships are clearly understood. The eleven key operating positions include:

Figure 1

PHASE RELATIONSHIPS



- ▶ Director of the Department
- ▶ Coordinator (i. e. Chief of Operations)
- ▶ Superintendent of Districts
- ▶ Assistant Superintendent of Districts
- ▶ Arborist
- ▶ General District Foremen
- ▶ Assistant District Foremen
- ▶ General Sanitation Foreman
- ▶ Sanitation Section Foremen
- ▶ Tree and Landscape Foreman
- ▶ Assistant Tree Foremen

Phase 2: Work Activity Definitions

We have found that the majority of the maintenance costs incurred are confined to a relatively few activities. On the other hand, a majority of the activities incur a very small portion of the costs.

We will analyze and select activities appropriate to Hamilton operations that will represent 85% to 90% of the work done. Selection will be made from the master set of work activities in the M. T. C. Implementation Manual. The remaining 10% to 15% of the work will be subjected to minimum control.

Phase 3: Classification of Roads and Collection of Maintenance Inventory Data

Levels of maintenance service and desired road conditions depend on the normal use to which a roadway is put. To apply maintenance policy, you must classify roads and collect data on those elements being

maintained by the Department.

We understand that the majority of this data is readily available. We will check this information for completeness.

Phase 4: Establish Performance Standards

In order to plan maintenance work and define the amount of work to be achieved, you require a variety of performance standards:

- | | |
|------------------------|---|
| Quality Standards | - Where quantity of work depends on level of service. |
| Quantity Standards | - Quantities of work for specific activities. |
| Productivity Standards | - Setting task objectives for specific crews, equipment and material. |
| Methods and Procedures | - Productivity depends on the resources utilized -- crewing, equipment and material -- and the manner in which these elements are deployed. |

It will be our job to ensure that these performance standards are adequately defined for the implementation of the system.

Phase 5: Develop Unit Cost Data

Extension of the productivity standards by activity results in unit cost standards. Unit costs bring together the cost of resources, the quantity of those resources, and the accomplishment (achievement of the end result such as miles, man-hours, etc.). These data are essential to the preparation of the Annual Performance Budget. These data also provide a basis for comparing actual cost performance against the plan.

Phase 6: Design and Implementation of Work Reporting and Feedback Systems

The work reporting and information feedback systems are vital to maintenance control. Information flow must be:

- ▶ timely,
- ▶ meaningful,
- ▶ applicable to specific areas of responsibility.

We will examine your present reporting system and retain those facets that are applicable. We will suggest modifications to your system to strengthen those areas that are found lacking.

We recommend that the initial implementation be made on a pilot basis in one district only -- and that reporting procedures be run manually. This assists in the development of an effective installation in a small area that will let you:

- ▶ prove reporting procedures,
- ▶ develop meaningful reports,
- ▶ provide a training ground for subsequent installations or expansions of the system,
- ▶ make an easy transition to a fully computerized system.

Phase 7: Develop and Implement Work Scheduling Procedures

Ultimately, it is by better management of time that supervisors become better supervisors. In reality, work schedules are simply statements of intentions to accomplish a given quantity of work in a given period of time. Thus, scheduling (or planning if one prefers the term) is really a device for better management of time.

Conceptually, there are three levels of scheduling:

- ▶ Annual Scheduling -- This is visual expression, usually in chart form, of the Annual Maintenance Budget. It illustrates all major activities, when they start and end, and what man-hours are likely to be consumed in each period (depending on your system of accounting periods, the period will be 13 equal periods or 12 monthly periods).
- ▶ Period Scheduling -- This schedule illustrates activities for the upcoming period only. It is prepared 12 or 13 times throughout the year by the staff planner.
- ▶ Weekly Schedule -- This is the key schedule because it is prepared by the first line supervisor -- the man who accepts responsibility to get the job done. This schedule illustrates activities for the upcoming week only. It is prepared every week. The supervisor uses the Period Schedule together with inputs from all other sources (himself, management, complaints, etc.) in its preparation.

Phase 8: Annual Work Program and Performance Budget Procedures

In this phase, we will develop and implement procedures which combine activities, work quantities (i.e. annual accomplishments), resources (labour, equipment and materials), and their cost -- to produce statements of the Annual Work Program. We intend that a program would be available in the new format before the beginning of 1976.

Phase 9: Winter Maintenance Plan

In reality, this is a segment of the Annual Work Program. It deals only with Winter Control activities, such as snow plowing, removal, sanding and salting, etc. It involves development of all elements for effective control of resources to achieve the desired level of service. Many of the elements are already well defined -- for example, snow clearing routes and emergency procedures. Our role will be to assist you to ensure their completeness. You have a forecasting problem because of the varying severity of winter. This

problem is compounded in Hamilton because weather conditions occasionally vary between maintenance districts at the same point in time.

Phase 10: Monitor Operation of the System

We propose to monitor the system after implementation throughout 1976. This will involve diminishing involvement after the system is fully operational by May 1st, 1976 or earlier.

Phase 11: Documentation of the System

We will fully document all elements of the Maintenance Management System.

The consultant will be available essentially on a full-time basis to provide leadership and guidance to successful completion of the project.

C. YOUR PART

This is going to be your system. Your organization must therefore be geared to accept it. This means that members of your staff should participate in the development of the system.

We believe that your current staff can undertake the initial implementation phase. There will have to be:

- ▶ some realignment of duties,
- ▶ clearly defined duties and responsibilities.

This involvement will ensure an understanding of the system.

As implementation proceeds and the workload increases, the staff position of maintenance planner will have to be filled.

IV

TIME AND FEE SCHEDULE

The program outlined in this proposal can be completed at an up-set cost of \$69,000. This amount includes the full-time services of a senior consultant and all necessary participation by our management staff and expenses at cost. Expenses include travel and living outside of Toronto, long distance calls, report production and miscellaneous items.

Our fees are billed monthly on a progress basis and are payable when rendered.

You are free to terminate the program at any time and are responsible only for the fees and expenses accumulated to that date.

You have divided the project into eleven major phases. Our estimate of cost and man hour requirements for each phase is shown in Table 1.

We will prepare a detailed program schedule within two months of starting the project. This schedule will identify:

- ▶ specific steps
- ▶ specific responsibilities
- ▶ specific start and completion dates for each activity
- ▶ built-in project progress check points.

This schedule will be modified as the program progresses, if required.

You have asked that we submit an estimate to cover the cost of drafting, duplicating, secretarial, clerical and other incidental services as an alternative to the City of Hamilton providing these services.

Table 1

PROJECTED COST - TIME SCHEDULE

Phase	Estimated	
	Cost \$	Man Days
1. Review organization	6,571	20
2. Define work activity	3,614	11
3. Classify and inventory roads	5,257	16
4. Establish performance standards	7,228	22
5. Develop unit cost data	3,614	11
6. Design and implement documentation	9,859	30
7. Introduce work scheduling	8,871	27
8. Introduce budgeting procedures and develop 1976 operating budget	5,586	17
9. Plan winter roads maintenance	5,586	17
10. Monitor the program	5,586	17
11. Documentation	7,228	22
TOTAL:	69,000	210



We estimate the cost of providing these services at \$4,500 for Phases 1 - 9 of the project.

We can start the project within three weeks of awarding the contract, and provided everyone does their part, we would expect to be fully operational in ten months time. We also believe in monitoring the installation after initial implementation. We will make ourselves available for follow-up sessions, monitoring the program and consultation at intermittent periods throughout 1976. This will ensure you have a viable and ongoing management program for road maintenance.

OUR CREDENTIALS

Stevenson & Kellogg, founded in 1934, is the largest wholly Canadian, employee-owned, general management consulting firm in Canada.

Our experience includes projects touching all phases of productivity improvement in every industry. Specific projects in the maintenance management field include installations in:

- ▶ Refinery (Petrochemical)
- ▶ Open Pit Mines
- ▶ Urban Road Management
- ▶ Ore Processing Plant
- ▶ City Works Department
- ▶ Naval Overhaul Base.

This sample includes projects in both the private and public sector.

We are management consultants. We take pride in our reputation. In all our work we seek to apply sound management principles and practices to develop improvements in planning and operations.

Technical problems in a productivity program are a rarity. If problems occur, the cause is usually the human resistance to change. Management, supervision and employees must be prepared to accept change. We place strong emphasis to ensure complete understanding of the program. This greatly increases the probability that our work will be completely successful.

We believe in involving people. In what we say and do there is

a positive, improvement oriented tone. The goal is a more effective maintenance operation. Our emphasis is on the people who will be responsible for running the system after Stevenson & Kellogg has gone.

Our staff are all experienced and qualified professional consultants with many years of practical experience in line management. Staff to conduct and supervise the installation of your managed maintenance program will be selected from the people whose resumé's are included in Appendix A.

APPENDIX A

RESUMES

APPENDIX A

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RESUMES

BROWN, Andrew H., B.A.

Senior Consultant. Joined Stevenson & Kellogg in 1974.

Formerly: Consultant with an international management consulting firm.

Consulting Experience: Operator training programs, maintenance work measurement training programs, organization studies, work planning and control, production scheduling.

Clients Served: Chemical plants, animal feed manufacturers, educational publishers, pharmaceutical, building construction, machine tool, electronic, automotive body assembly, hospitals, shipyards.

KING, Donald L., B.A.Sc. (Chem. Eng.), M.B.A. (Gen. Mgmt.), P. Eng. , C. M. C.

Vice President. Joined Stevenson & Kellogg in 1955.

Formerly: Industrial Engineer for a ceramic tile manufacturer.
Quality Control Process Engineer for electric motor producer.

Consulting Experience: General management, organization planning, productivity improvement, municipal administration, municipal maintenance audits.

Clients Served: Educational bodies, institutions, associations, paint, utilities, grocery products, construction, heating, furniture, tobacco, flour.

NORVAL, George B., B.Sc.(Physics, Maths.), C.M.C.

Manager. Joined Stevenson & Kellogg in 1965.

Formerly: Plant Manager for a plastics manufacturer, Industrial Engineer for a producer of optical lenses and Methods Engineer for an automotive electrical products manufacturer.

Consulting Experience: Municipal management, organization and staff planning, plant layout, maintenance control, materials handling, workplace methods improvement, time standards development, incentive plans, job evaluation, planning and administration.

Clients Served: Municipal authorities, utilities, educational bodies and institutions, governments, construction, bakery products, stationers, confectioners, automobile parts, electronics.

SPENCER, James M., B. Eng. (Mech. Eng.), P. Eng.

Senior Consultant. Joined Stevenson & Kellogg in 1971.

Formerly: Supervisor of Central Engineering for a copper and brass mill, Manufacturing Manager for a bronze manufacturer.

Consulting Experience: Production planning and control, maintenance cost control, corporate planning and budgeting, transportation studies, material handling, feasibility studies.

Clients Served: Foundries, sheet metal works, lumber, hospitals, air conditioning, heating, governments.

STUART, Stuart W., B.Sc.(Mech.Eng.), P.Eng., C.M.C.

Senior Consultant. Joined Stevenson & Kellogg in 1966.

Formerly: Chief Industrial Engineer for a major manufacturer of distribution equipment. Plant Manager for a die-casting and a screw machine products company.

Consulting Experience: Maintenance management, facilities planning, work measurement, statistical analysis, management control systems, inventory and production control.

Clients Served: Pulp and paper, newspapers, dairy products, mines, fisheries, petroleum refineries, plumbing manufacturers, foundries, electronics, hospitals, detergents, aircraft manufacturers, government departments, municipalities.

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